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SBIR

SMALL BUSINESS INNOVATION RESEARCH **2012**

TIBBETTS | SBIR

AWARDS

HALL *of* FAME

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U.S. Small Business Administration

CONGRATULATIONS TO THE RECIPIENTS OF THE 2012 TIBBETTS & SBIR HALL OF FAME AWARDS

Created in 1953, the Small Business Administration (SBA) helps Americans to start, build, and grow their own companies. Its mission often is described as the “three Cs”: facilitating access to capital, providing counseling, and ensuring that small businesses receive a quarter of federal contract dollars.

One key way the SBA accomplishes these goals is through two programs: one devoted to small business innovation research (SBIR), the other to small business technology transfer (STTR). Through these competitive programs, SBA ensures that the nation’s high-tech, innovative, small businesses are a significant part of the federal government’s research and development (R&D) efforts.

These programs have helped thousands of small businesses over the years. Today, we recognize the crème of the crop – those companies and individuals across the country that have used their SBIR/STTR funds to advance technological innovation and stimulate economic growth.

Tibbetts Awards

Named after Roland Tibbetts, who was instrumental in developing the SBIR program, the Tibbetts Awards are presented annually to those who are beacons of promise and models of excellence in high technology. Winners are selected based on the economic impact of their technological innovation, and the extent to which that innovation served federal R&D needs, encouraged diverse participation, and increased the commercialization of federal research. There are two types of Tibbetts Awards: awards for businesses that have participated in the SBIR Phase I and II award programs, and awards for individuals who have supported the SBIR Program.

SBIR Hall of Fame

The SBIR Hall of Fame recognizes companies with a long period of extraordinary success of research, innovation, and commercialization within the SBIR program. To be eligible for the award, a nominee must have won a SBIR award and continued to contribute significantly to the goals of the SBIR program.

In the pages that follow, we profile each recipient and its achievements. Individually, these profiles evince remarkable ingenuity, resolve, and success. As a whole, they demonstrate a remarkable range of benefits – locally, regionally, and nationally – and sustain the conviction that America’s future is as bright as its past.

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SBIR 2012
TIBBETTS
AWARDS

JOHN P. WASZCZAK, PH. D

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John P. Waszczak, PhD transformed his B.S., M.S., and PhD degrees in Mechanical Engineering from Carnegie Mellon University into a career that continues to expand new technology and stimulate the economy. Currently, John Waszczak serves the community in support of business and technological development through his own new small company, John Waszczak & Associates, LLC.

His career was spent perfecting a number of landmark engineering achievements with General Dynamics, Hughes Aircraft, and, most recently, Raytheon Missile Systems. Volumes could be written on his engineering and management expertise, but he prides himself mostly on his efforts since 2004 in support of the SBA's SBIR/ STTR programs. As Director of Advanced Technology and SBIR/ STTR at Raytheon Missile Systems, John has appropriately earned the title of "SBIR guru" on the local, State of Arizona, and national levels for his commitment to cultivate innovation within small high-tech businesses in service to the government's need for new technology. This involvement puts him in direct contact with agency heads within the Department of Defense, SBA officials, Congressmen/ Senators, Governors, economic development, academic, and industry/community leaders . . . as well as an expanding list of promising small businesses.

Indicative of John's vision was his creation of a singularly successful program in Tucson, AZ that fueled the collaboration of prime contractors, industry clusters, high-tech small businesses, and the BusinessLINC Program (originally grant funded by the SBA to stimulate mentorship and buyer/ seller matching – housed within the City of Tucson's Office of Economic Development). This concept involved the identification of "topics of interest" from prime contractors related to published solicitations within the SBIR/ STTR programs. These topics were screened for relevance to the various industry clusters (optics, plastics and composites, nanotechnology, aerospace, advanced manufacturing, and bio-industry). The topics, briefly stated, were then circulated to the cluster memberships without prime contractor identification. Respondents were screened and referred to each prime for review. Matches were guided through the proposal process, including providing a Letter of Support. This resulted in both Phase I and Phase II SBIR's and STTRs with the University of Arizona.

BIOSTRATEGIES, LC

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The award to this team is particularly focused on the team's first SBIR Phases I and II from NIH for genetically engineering tobacco to express the human enzyme, glucocerebrosidase, which, if defective, causes Gauchers disease, a rare genetic disease usually fatal in childhood. This SBIR research was conducted at Radin and Cramer's first company, CropTech, founded in 1993.

By the end of this first SBIR project, CropTech could show for the first time that a human disease gene coding for a complex protein like glucocerebrosidase could be successfully inserted into a plant genome such as tobacco to express a biologically active human enzyme for potential use as a therapy for a disease like Gauchers. The success of this first SBIR project and the subsequent award of a second related SBIR project on the rare Hurlers Syndrome allowed David to terminate his position in academia in favor of spending full time running the business and growing the medical product R&D portfolio of CropTech. However, Carole has remained in academia to build a long term business-university relationship.

Over the next several years CropTech grew to 45 employees as additional SBIR's and other funding were won by the CropTech Radin/Cramer team. The company was able to extend its R&D into expression of other human proteins for treating cancer, and for protein components of vaccines for infectious diseases such as anthrax, plague, and flu. One of the most satisfying recent results in this history is that the patent granted to CropTech in collaboration with Virginia Tech for plant-based production of Gauchers and other human lysosomal enzymes was licensed about six years ago to another plant biotech company, Protalix, who has taken this plant produced Gauchers ERT technology to clinical trials in patients world-wide and, in partnership with the pharmaceutical giant, Pfizer, is expected to receive final approval for US and worldwide marketing of this billion dollar product this spring.

Thus, the future growth of this new plant-based green energy manufacturing industry, while still at its beginning, now has a strong prospect of growing into a new multibillion dollar international biotech industry with the creation of thousands of high wage jobs. And this was all started by a high risk SBIR grant from NIH to a couple of plant scientists with an innovative vision and plans for a new startup company who came to them with no previous experience in health research or business.

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San Diego Composites was literally founded on the principles of the SBIR/STTR program. The company was established in 2002 after winning three Phase I awards from the Missile Defense Agency. Since then, SDC has utilized the opportunities provided by the SBIR program to develop innovative technologies, establish and develop relationships with prime contractors, and grow the business all while providing a good rate of return to the government through strong technology development. The specific research and development needs were focused on using composite materials to reduce the weight of defense products for missiles. From those Phase I awards, Phase II contracts followed.

The company founders did not rest with those first three SBIR awards and soon pursued Phase III business with the Department of Defense (DoD) prime contractors. In the years that followed, SDC has been awarded several multi-million dollar direct contracts from DoD prime contractors related to missile defense structures, missile launch canisters and commercial space. In addition to continuing to provide engineering solutions, SDC has invested in a state of the art manufacturing facility for the production of aerospace quality composite products.

Today, SDC has grown to a company of 30 employees with annual sales over \$6 million. SBIR projects comprise about a third of SDC's revenue and the company continues to generate innovative projects that provide the seeds for organic growth of SDC.

STOTTLER HENKE ASSOCIATES, INC.

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Founded in 1988, Stottler Henke Associates, Inc. creates and applies artificial intelligence and other advanced software technologies to solve problems that defy solution using traditional approaches. Stottler Henke combines its artificial intelligence expertise and technologies with broad skills in expert knowledge elicitation, requirements analysis, software and database design and implementation, data analysis and visualization, and user interface design to deliver innovative software solutions for training and education, planning and scheduling, knowledge management and discovery, and decision support. The firm's technology consulting, feasibility studies, and rapid prototypes help companies identify and validate promising applications and approaches. Their software development, implementation, and technology transfer services ensure the successful deployment of effective, practical, long-term solutions. Key software products include the Aurora™ intelligent scheduling system, the SimBionic® intelligent agent toolkit, and the DataMontage™ data visualization system. US Government agencies have designated ten Stottler Henke systems as Small Business Innovation Research (SBIR) success stories. Four Stottler Henke systems have been included in Spinoff, NASA's showcase of successful spinoff technologies. Stottler Henke was the subject of a NASA "Hallmarks of Success" video profile for its work developing and later commercializing advanced scheduling and training software systems. Stottler Henke received a "Brandon Hall Excellence in Learning" award for innovative technology. Stottler Henke was named one of the "top 100" companies making a significant impact on the military training industry by Military Training Technology magazine for 2011 and seven previous years. Stottler Henke has received a Blue Ribbon from Military Training Technology magazine, recognizing it as a company that leads the industry in innovation.

SYSTEMS TECHNOLOGY INC.

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Systems Technology, Inc. (STI) is a 100% employee-owned, small research and development firm located in Hawthorne, California. STI developed PARASIM®, a parachute training simulator for the US Forestry Service (USFS) to improve the training methods and reduce accidents for USFS “smokejumpers”. In 1998, STI received a USSOCOM SBIR Phase I and in 1999 a Phase II award entitled “Tactical Insertion Mission Planning and Rehearsal System (TIMPARS),” to enhance the mission-planning features of PARASIM®, including the PC-based computer graphics, incorporation of real-world terrain data and imagery, wind field modeling, and system networking to enable multiple jumpers training in a shared, interactive simulation. This enabled STI to increase its staff and staff expertise in the area of computer graphics and simulation technology. Today PARASIM® is a virtual reality system using head-mounted displays, advanced graphics, and real world scenes, with over 300 systems in service, worldwide. STI believes that the greatest benefit of PARASIM® has been in the increased safety for parachute deployment by US military pilots and the increased safety and increased effectiveness of training, mission planning and rehearsal of US Special Operations teams. STI has also been able to export PARASIM® to countries such as Canada, the U.K., Norway, Spain, Australia, Brazil and others.

AXION BIOSYSTEMS, INC.

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Incorporated in early 2008, Axion has developed proprietary technology to precisely interface and manipulate cells and tissue. This novel platform opens up new product opportunities in a wide range of applications including life science instrumentation, medical diagnostics and implantable stimulation devices. The broad applicability of Axion's technology provides numerous pathways to growth.

Axion's initial SBIR supported the development of our microelectrode array (MEA) system used for life science research. This product addresses needs in the \$1.3 billion Drug Screening and Toxicity Testing market (BCC Research, The Market for Invitro Toxicity Testing 2010). To address specific needs in this market, Axion has developed a cellular electrophysiology tool.

Axion's second SBIR supports the development of our nerve conduction study (NCS) device for the Medical Diagnostic market. NCS are performed on a daily basis by neurologists to diagnose nerve degeneration. Remarkably, this technology has not changed in 30 years. Conventional systems require that physicians use two large surface electrodes to identify and shock the patient's nerve, measuring the speed at which the nerve pulse propagates through the body. This slow, painful, and error prone method requires significant training to manage testing administration and result interpretation. In contrast, Axion's proprietary technology enables physicians to conduct automated tests using microelectrodes to electrically image the nerve in a significantly more accurate and pain free manner.

Axion's third SBIR was awarded to develop flexible, implantable microelectrode arrays for the \$1.3 billion market for Implantable Neuro-Stimulation Devices. These arrays will be designed to conform the body's soft internal tissue. Ultimately, Axion expects the product developed will enable precise control over aberrant brain activity, such as detecting and preventing epileptic seizures before they occur.

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Ms. Pyne has had the unique experience of working as the SBIR Program Manager at NSWC Crane as well as the SBIR Director for the State of Indiana. The two positions provided the opportunity for her to guide a project from inception to fruition; however her skills and determination made her a recognized leader and valued resource for the SBIR community. Her SBIR career began in 2002 at NSWC Crane where she was tasked with developing a program that had not been as successful as anticipated, into a thriving program for the Crane S&T Division. Her mission began by engrossing herself in the S&T community at NSWC Crane and conducting educational training sessions to create awareness for the program and processes. She also engaged the National SBIR/STTR Program Managers from Agency Sponsors to ensure that Crane was included in future Calls for Topics. Through her efforts, the number of Crane Subject Matter Experts submitting topics increased, as well as the number of agency sponsors selecting topics written by Crane Subject Matter Experts, resulting in an overall growth of over 500% over the course of four years.

Ms. Pyne's successful transformation of the NSWC Crane SBIR Program caught the interest of the Indiana Economic Development Corporation (IEDC). The IEDC did not have an established SBIR/STTR program and recognized the necessity of hiring an expert to stand up the program. In 2004, the IEDC hired Ms. Pyne and in a few short years she was able to increase SBIR funding by 50%.

ROY KELLER

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Roy Keller is technology program professional and SBIR advocate with over two decades of experience. He currently serves as the Associate Director of the Louisiana Business & Technology Center (LBTC), E.J. Ourso College of Business, located at the Louisiana State University Innovation Park in Baton Rouge, LA, where he has worked for nearly 20 years. In this capacity, Keller also directs the Louisiana Technology Transfer Office (LTTO), one of three main components of the LBTC. The office has a statewide mission for technology transfer and commercialization activities throughout the state of Louisiana, providing a unique platform for Keller to market, encourage, educate and enhance the SBIR program in Louisiana. Roy Keller was instrumental in growing a technology transfer office at NASA's John C. Stennis Space Center, located just across the border along the Gulf Coast in Mississippi and for establishing new partnerships with NASA at the Michoud Assembly Facility in New Orleans, LA.

Keller serves on a number of key stakeholder organizations that help support SBIR, including the State Science and Technology Institute, the Federal Laboratory Consortium, the Louisiana Technology Council, and Partners For Stennis, an economic development group with members from Mississippi and Louisiana. Keller sits on their industry advisory panels and promotes the transfer of the technology developed under these programs. In addition, Keller has on several occasions served as a reviewer for SBIR Phase I proposals at the National Science Foundation. He sits on the Louisiana Tech University's internal Technology Triage Panel, tasked with reviewing technologies developed by that university's faculty and recommending a course of action to the Vice President of Research. Keller serves on the board for the Southeast Regional Federal Laboratory Consortium.

Roy Keller is a recipient of the "2010 National Milton Stewart Award" from the National Small Business Technology Council given to those who are recognized for contributing to and advocating for American small business technology companies.

FHC, INC.

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From company inception in 1977 to 1997, the company was strictly a research company. Their first SBIR award in 1997 was written by researcher Dr. Lee Margolin of FHC and provided the basis for an electrode to record and stimulate these synapses. FHC then created an electrode to do just that which was cleared as a medical device in 1999 and thus launched their role in manufacturing and selling medical devices for clinical use.

FHC has expanded offerings into what they term “cranial targeting” with applications for diseases of the central nervous system and the patients who respond well to restorative neurosurgery. FHC is currently working under an SBIR for the Instrument for Intracerebral Microinjections (IMI) which has proven well-suited for direct delivery of therapeutic agents, an emerging area of neurosurgical treatment.

Its last award from the National Cancer Institute is the development of Convection Enhanced Therapeutic Delivery System (CEDSYS) for the treatment of Glioblastoma multiform (GBM) which is a form of brain cancer. If successful in their research, CEDSYS offers hope for patients with aggressive malignancies for which no effective treatment exists.

FHC’s customers are primarily scientists or research physicians at major universities and research institutions around the world. It has established strong collaborations at major research institutions such as Vanderbilt University, and continues partnerships with Medtronic and St. Jude Medical. Open collaboration with these customers creates new products to advance the science of brain research into the field of neuroscience.

CLARA ASMAIL

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In 2007, Clara Asmail as NIST SBIR Program Manager pioneered a new methodology facilitating US small businesses to spin-out commercially-viable technologies emerging from NIST's focused research. Using its Small Business Innovation Research (SBIR) Program funds, NIST incentivizes small US companies to create financially rewarding innovations by researching, developing and advancing NIST-originated technologies with the goal of transitioning NIST intramural research into the market. The goal of transitioning research to the commercial market is also the goal of federal technology transfer programs. The use of SBIR funds to achieve federal technology transfer is a novel systematic approach to merging these two complementary infrastructures in order to leverage the advantages of each program for synergistic growth.

Through the first four years of implementation, 35 federal technologies were included in the NIST SBIR TT Program. Many of those resided in the public domain. However, of the 19 which were patented protected and for which non-exclusive, royalty-free licenses were granted to the SBIR Awardees, two have converted to royalty-bearing exclusive commercial licenses in response to the commercial value returned to the SBIR Awardee.

After proving the concept and benefiting from continuous improvement evaluations, Ms. Asmail has reached out to other agencies communicating with their SBIR Program and Technology Transfer separately to share motivation for the approach and lessons learned. As several of these agencies have engaged in internal discussions to implement the approach, Ms. Asmail has contributed to these agencies in a consultative role to explore unique circumstances and develop refinements.

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Mr. Marchessault has been on staff at TATRC since 1998. He was initially involved in projects that involved technology development such as the Operating Room of the Future Portfolio and the Advanced Medical Imaging Portfolio utilizing the Triple Helix of Business i.e. Industry, Academia and Government. Many of the projects that he has strategized and managed with both early stage and mega cap companies have now resulted in commercial products. During the past three years Mr. Marchessault was asked to create a unique Department of Defense Commercialization/Technology Transfer Program (C/T2) as a model at TATRC that could potentially be transported to other agencies. A C/T2 program with a holistic approach evolved that leveraged federal investment with private sector capital to commercialize federal medical R&D technologies. Mr. Marchessault's novel approach to this problem is to consider the entire process of R&D, commercialization strategy, and investment (using both nondilutive and dilutive capital). Ron has designed a program that begins with the premise that most agencies and small businesses in adequately understand commercial potential and therefore are not the best decision makers to develop their commercialization strategy. He emphasized that that federal investments made be based on the understanding of four basic questions: 1. what is the problem needing a solution , 2.how important is the problem , 3. is the proposed solution better than the current solution and, 4. who will buy it?

Mr. Marchessault utilized numerous funding opportunities including Congressional Special Interest, Internal Gap Funding, Army Advanced Medical Technology Initiative (AAMTI), and SBIR/STTR Funding to fund federal medical R&D within the DOD as leverage in mitigating risk to private sector capital. The core of the C/T2 Program is structured to provide tools and programs to; Assess Commercial Viability, Market federally funded R&D and promote the Economic Impact in the Healthcare Market, DoD and State and Federal Governments. These efforts have resulted in quantifiable outcome measures outlined below that will allow tracking and continuous improvement of the program

TRX SYSTEMS

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TRX was started by University of Maryland Professor Gilmer Blankenship as a small electronics company subcontracting services for device prototyping and smart sensor networks with one full time employee. An early subcontract, driven by both September 11th and several widely publicized tragedies (notably the Worcester, MA warehouse fire in 1999), was to build electronics for indoor tracking of fire fighters. Excited by the promise of the early work and the broader lifesaving implications of the technology, TRX applied for NSF SBIR support. TRX was selected for award in January 2007. The SBIR program provided both financial support and business advice. The support helped TRX to establish a new company focus on infrastructure-free indoor tracking, fully develop the technical ideas and develop a business growth strategy.

Since receiving its NSF SBIR award, TRX has steadily grown its business making its first test prototype system sale to the Maryland Fire and Rescue Institute in 2007. A sale was made to NIST in 2010 to aid in the development of tracking standards and last year marked its first international sales in Singapore and Malaysia in 2011. Revenues have expanded by a factor of 10 and employment by a factor of 15.

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One of the most serious threats faced by the United States is the possibility of terrorists smuggling the components of a nuclear weapon into the country. Detecting the illicit nuclear materials that make up such a weapon is critical to protecting the country. One way to determine the presence of nuclear materials is to detect and identify the characteristic x-ray and gamma-ray signatures of these materials such as highly enriched uranium and weapons grade plutonium.

Current technology for detecting neutrons found in nuclear materials utilizes the chemical element helium-3, which is a by-product of the United States nuclear weapons program. The stockpile of helium-3 has been drastically drawn down over the past ten years as the federal government has increased its use in neutron detectors, and ceased developing nuclear weapons. Helium-3 began to fall into short supply over the last six years, reaching critically low levels in 2009. Testimony before Congress in 2009 resulted in a nationwide search to find new materials to enable the U.S. to continue to secure our borders and protect our citizens. The Department of Homeland Security (DHS) and the Domestic Nuclear Detection Office (DNDO) have taken the lead with programs to find a substitute for helium-3.

RMD answered the call for a helium-3 substitute with a material named CLYC (Cs₆LiYCl₆). CLYC not only has the ability to replace helium-3 to detect neutrons, but can detect gamma rays as well. Utilizing pulsed shaped discrimination, CLYC can detect and separate the signals from both neutron and gamma sources. The dual mode capability of CLYC will act as the scintillation material in a new generation of radiation instruments developed to uncover dangerous nuclear materials that terrorists might try to smuggle into the country.

RMD was recognized by DHS for accomplishing low rate production of CLYC scintillator crystals. RMD is providing scintillation crystals in support of DNDO's exploratory research programs. In particular, these materials are the key enabling technology for DNDO's Advanced Radiation Monitoring Devices (ARMD) program. RMD's consistency in meeting the DNDO milestones, and providing high quality CLYC scintillation crystal in a timely manner to the ARMD program is central to the success of this critical program.

VIDA HEALTH COMMUNICATIONS, INC.

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Since 1985, Vida Health Communications, Inc. (Vida) has kept a pace with sweeping changes in the healthcare industry and innumerable shifts in technology. More than twenty five years later, Vida remains a leader in maternal and child health education. Vida sustains a full-time staff of eight employees and average annual revenues ranging from \$500,000 to \$1 million. Although Vida's revenues might not be considered that of Fortune 500 companies, Vida's numerous contributions to the field of public health shape current caregiving practices for populations at risk and the clinicians who care for them.

Vida distinguishes itself by incorporating evidence-based practice guidelines, using panels of experienced expert consultants and conducting extensive pre-production research. Doing so allows Vida to tailor each program to its audience. Vida's documentary approach to video content conveys credibility in a way that other approaches cannot. Its programs reflect the diversity of Americans. By focusing its lens on real people—health care givers and patients—Vida opens a direct line of communication with its viewers.

Vida's NIH supported work made possible expansion into new markets and fostered diversification beyond patient education departments in hospitals, which had been Vida's primary clientele prior to receiving SBIR funding. Now, findings from field studies and other quasi-experimental evaluations funded by the NIH lend further credibility to Vida's prevention and health promotion media tools and help insinuate the company's products into new markets.

In February of 2008 Vida completed the evaluation of a Phase II project Supporting the Development of Preterm Newborns (2 R44 HD42313-03) to develop a multidisciplinary multimedia toolkit for NICU care providers about preterm infant brain development and developmental care practices.

ADVANCED CIRCULATORY SYSTEMS, INC.

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Advanced Circulatory Systems, Inc. (ACSI) was founded in 1997 by Dr. Keith G. Lurie, an emergency care physician with expertise in cardiac arrest. The company evolved based on Dr. Lurie's invention of a new therapy for the treatment of hypotension (i.e., low blood pressure) and elevated intracranial pressure called Intrathoracic Pressure Regulation (IPR). IPR therapy focuses on creating a vacuum inside the chest cavity to enhance circulation, increase blood pressure and lower intracranial pressure (ICP). The vacuum pulls more blood back to the heart from the extremities, resulting in more blood being circulated. ACSI restores circulation, naturally.

ACSI developed its first product, the ResQPOD® Impedance Threshold Device, to deliver IPR therapy to the population that inspired its invention—cardiac arrest patients. The company launched the ResQPOD in the United States in 2005 with FDA 510(k) approval for use in the military, emergency medical services (EMS), and hospital markets. The company's second product, the ResQGARD® Impedance Threshold Device for breathing patients, was launched in 2009 for use in the same markets. These products generated a combined annual retail revenue stream in excess of \$7.25 million in 2011. In addition, ACSI has developed and will launch its next generation device in 2012, the ResQVent™.

ACSI achieved its success to date by hitting several important milestones. The company:

- has received the support of nine Phase I and eight Phase II Department of Defense and National Institutes of Health SBIR awards, totaling \$14,600,000 in funding.
- has raised over \$9 million of private equity.
- has the support of over 50 published clinical articles, demonstrating a 50% increase in blood flow and resuscitation;
- holds over 25 patents on the ResQPOD, ResQGARD and IPR therapies;
- built a sales support and education organization capable of creating an imperative for use with its technology; and
- has a platform of 1,500 military, EMS and hospital customer accounts in the US.

PRIMORDIAL

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Primordial is a private company located in Saint Paul, Minnesota. Incorporated in 2002, Primordial is the leader in off-road route planning software. Primordial's flagship product, Ground Guidance®, is an SBIR-funded product serving defense and consumer markets.

Ground Guidance is patented, fielded software developed under contracts with Army Geospatial Center (AGC), Communications-Electronics Research Development and Engineering Center (CERDEC), Defense Advanced Research Projects Agency (DARPA), Natick Soldier Research Development and Engineering Center (NSRDEC), and Product Manager (PM) Movement Tracking System (MTS) that enables small unit leaders to perform rapid terrain analysis, load planning, and route selection. Ground Guidance supports planning multiple fast and concealed routes both on- and off-road for dismounted and mounted soldiers. Ground Guidance also enables soldiers to perform line of sight (LOS) analysis, predict future movements based on past sightings, and route around threats such as likely sniper nests or historic improvised explosive device (IED) locations. Primordial has integrated Ground Guidance into several battle command platforms such as Falcon View, Google Earth, Land Warrior, and MTS. In 2011, Primordial fielded Ground Guidance to Land Warrior-equipped Army and Special Forces units.

In the defense market, Ground Guidance plans fast and concealed routes for dismounted and mounted soldiers. Primordial's defense customers include the DARPA, United States Army, USAF, USMC, General Dynamics, Lockheed Martin, and Rockwell Collins. In the consumer market, Ground Guidance is the leader in pedestrian routing. Primordial's consumer partners include Magellan, GPS Tuner, and View Ranger.

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Nanoparticle Biochem, Inc. (NBI) is a nanotechnology based company started from the intellectual property generated by team of scientists from University of Missouri. From the time of inauguration, NBI has successfully capitalized on funding from several federal (NCI/NIH), state agencies (MO SBDTC), and private pharma companies for developing cancer diagnostic and therapeutic nanotechnologies for solving unmet key clinical issues. NBI has developed a novel nano-therapeutic agent NBI-29 to treat solid tumors. NBI-29 is currently under Phase I level clinical trials in prostate cancer dogs. This trial is funded by NCI/NIH under SBIR Phase II contract mechanism. In addition, NBI manufactures and sells an array of nanoparticle-based products that encompass biocompatible nanoparticles, nanoparticulate antimicrobial agents, and specialty bio-chemicals.

NBI's core competencies include an ability to perform cutting edge research and to develop innovative pathways for the synthesis of a wide spectrum of gold, silver, palladium, iron oxide, and platinum nanoparticles and nano-bioconjugates. NBI's nanoparticle enhanced antimicrobial agents are effective against black mold, MRSA, and water and air borne pathogens, currently under process for EPA approval. NBI also generates revenue from its commercial sales of over 150 different types of nanoparticles. NBI also markets products directly and also through corporate partnerships.

BRIDGER PHOTONICS, INC.

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Rarely do small businesses bring forth groundbreaking innovations that enable multiple technology platforms serving industrial, military and societal needs in ways orders of magnitude better than existing technologies – if those needs could be addressed at all. Rarer still is the small company that could rapidly and successfully bring such new technologies to the commercial marketplace without the huge infusions of cash typical of Venture Capital investments in densely networked regions like Silicon Valley or Boston.

Bridger Photonics, Inc., located in the rural and historically isolated community of Bozeman, Montana, has done just that, developing and commercializing a series of breakthrough technologies based on major new innovations in lasers and optics, through its targeted and judicious use of funding from the SBIR/STTR programs. Though only started in late 2006, BPI's success was recently heralded by being named to the 2011 Inc. 500 list of the "Fastest Growing Private Companies in the US," ranked Number 1 among the "Top Engineering Companies" on that list. Commercial sales already make up more than 20% of total company revenue, targeted to grow to 50% of total revenue by 2013.

Bridger Photonics Inc. is a rapidly growing firm with high impact technology innovations, which meet critical military and civilian needs across the U.S. and society as a whole. They have demonstrated the highest priority on technology commercialization, and have already succeeded in commercializing several highly advanced technologies, selling to both government and commercial customers. They have set high standards for both innovative technology applications and business performance, serving as an exemplary model for other industry and entrepreneurs in the region, and strongly promoted mutually beneficial collaborations with the university, federal labs, and other industry. Having already won 17 SBIR and STTR awards in the short span since their formation in 2006, and using these awards for the purposes intended of the SBIR/STTR programs – developing important new innovations and bringing them into commercial production.

THE DESIGN KNOWLEDGE COMPANY (TDKC)

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TDKC has proven itself to be a pioneer in the development of decision support and situation awareness applications to support US space warfighters. In particular, TDKC's development of the next-generation JMS UDOP capability is an example of how SBIR funding can be used to successfully transition conceptual prototypes into fully accredited products for the nation's warfighter. The VISTA programs central concept includes delivering space superiority capability to the warfighter by leveraging data fusion, data mining, and mixed-initiative problem solving techniques, and advanced visualization to rapidly compress and encode large amounts of data that provide "at-a-glance" coherent operational picture for space operators. VISTA also includes the fusing of unconventional intelligence to enable rapid, mixed-initiative decision support based on actionable information.

Significant technical accomplishments that have been made as part of the VISTA SBIR include: (1) Framework for composable Common Operating Picture. – this allows the operator to create what they need for a particular mission (2) Custom organization, grouping of visualization components – next-generation 3-D capability (3) Configurable connection to web service endpoints; this allows the UDOP access to new data sources without new code development. (4) Addition of role-based security to all visualization components – provides the necessary security (5) Natural language processing integration. – advanced technology to improve operations (6) Integrated case-based reasoning components. – assists the operator and reduces errors The warfighter value and significance of the VISTA SBIR development are further substantiated by a recent real-world activity that TDKC was asked to support using VISTA tools. The overwhelmingly successful results from this event (and subsequent accolades TDKC received from Air Force general officers and JSPOC personnel) underscore the advanced capabilities and how it can support a number of national priorities.

CHI SYSTEMS, INC.

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CHI Systems is a leader in human-centered solutions for training, simulation and decision support systems that address a broad spectrum of defense, security and safety needs. CHI Systems' solutions are based on over twenty five years of DoD-sponsored research and development and incorporate advanced capabilities in cognitive modeling, team training, cultural analysis, and visualization of complex data. Our staff of engineers, computer scientists, psychologists, instructional designers and military analysts are highly educated, holding many advanced degrees and with significant military expertise.

Since receiving a Tibbonets award in 2001, CHI Systems has developed innovative new technologies derived from SBIR work in areas critical to defense and security: Tactical Combat Casualty Care (TC3), Cultural Intelligence, Unmanned Systems, and Non-Kinetic ("Soft Skills") Training. In the TC3 area, CHI developed a novel solution to training warfighters in battlefield medical treatment with intelligent instrumented manikins paired with mobile device technology. This program, called HapMed, was funded by Phase I, Phase II and Phase III SBIR awards in which CHI Systems teamed with the University of Central Florida. HapMed incorporates multimedia simulations, haptic training manikins, and pedagogically sound training principles to train combat medics and Corpsmen in the treatment of the three leading causes of preventable death on the battlefield: exsanguination, airway obstruction and tension pneumothorax. This SBIR-funded work led to 2010 Congressional funding for the development and evaluation of a haptics-based combat medic trainer suite. This program supported eight positions at CHI Systems and two at UCF, including two newly created positions at CHI Systems, and will result in lives saved on the battlefield.

PIASECKI AIRCRAFT CORPORATION

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Piasecki Aircraft Corporation (PiAC) is an aerospace research and development engineering and manufacturing company with a staff of approximately 50 employees specializing in the design, fabrication, rapid prototyping and flight test of experimental rotorcraft and unmanned aerial systems and technologies.

Founded by aviation pioneer Frank Nicholas Piasecki, PiAC is a leader in vertical lift technology. In 1943, Piasecki developed and flew America's second successful helicopter (the PV-2), and in 1945 invented the world's first tandem rotor helicopter (the XHRP-1) which led to the development of the H-21, H-46 and H-47. Piasecki sold its production company, Piasecki Helicopter Corporation to Boeing and the original research and development group formed Piasecki Aircraft Corporation in 1955 to explore advanced VTOL aircraft technologies including UAVs, heavy lift rotorcraft and high speed rotorcraft and other technologies. In all, Piasecki has designed, developed and flown over 28 advanced vertical lift systems. In 1986, Piasecki was awarded America's highest technical honor, the National Medal of Technology, presented by President Reagan for contributions in the advancement of the vertical flight and the Smithsonian National Air and Space Museum's Lifetime Achievement Award presented in 2005.

Piasecki Aircraft Corporation, performing under SBIR Topic OSD06-UM8, "Unmanned Aerial Vehicle - Combat Medic Collaboration for Resupply and Evacuation" (CM-UAV), developed, tested and flight demonstrated the world's first fully autonomous capability on a man-rated helicopter using its KlearPath™ navigation/sensor system developed under the CM-UAV SBIR program and company IR&D funding.

SEPARATION DESIGN GROUP, LLC

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As a small business and independent laboratory in rural southwestern Pennsylvania, SDGroup represents everything that the SBIR program is meant to support. The basic gas separations research and development done at SDGroup over the last 8 years is now being commercialized in medical devices. A non-medical commercial product embodying the same technology is also under development. They have leveraged their success in obtaining SBIR awards to secure state, local, and private funding to create a world class facility and provide jobs for highly skilled scientists, engineers and technicians. To date, SDGroup has 2 issued patents and 3 patents pending.

Since its founding in 2003 the company has worked primarily on developing very small, lightweight, portable oxygen concentrators. Early research was supported by National Science Foundation SBIR. These projects proved the concepts of ultrarapid cycle adsorption and developed instruments to evaluate and quantify the performance of materials necessary to the process. Subsequent work supported by National Institutes of Health STTR grants led to the development of oxygen generator components that are now being incorporated into wound therapy and respiratory therapy medical devices. SDGroup is also designing a non-medical consumer version of the oxygen technology for sports, fitness and high altitude uses.

In addition to the oxygen technology, SDGroup has ongoing projects and intellectual property in the renewable and sustainable energy sector, including a heat pump that has applications in drying, silent propulsion, solar thermal energy conversion, and combined heat and power. The company has also analyzed the effects of weathering on Marcellus shale drill cuttings for the National Energy Technology laboratory in Morgantown, West Virginia. These projects all take advantage of the extensive laboratory facilities that SDGroup has assembled in its repurposed 52,000 sq. ft. facility located in Waynesburg, Pennsylvania.

DR. REMIS GASKA/DR. MICHAEL SHUR (TEAM)

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Drs. Remis Gaska and Michael Shur founded Sensor Electronic Technology, Inc. in 2000 in order to develop new Deep UV solid state technology. Non-visible (ultraviolet) light sources are increasingly important elements in embedded systems, including bio-agent sensors and covert short-range non-line-of-sight communications systems. Especially important are new types of ultraviolet light sources that are compact, fast to respond, consume little power, last a long time, and are cost effective. Emerging applications include water purification, hospital and medical sterilization, post-harvest plant treatment, plastic curing, photolithography, and scientific instrumentation. Previous sources of deep ultraviolet (DUV) light were bulky, consumed a lot of power, provided only a limited set of emission wavelengths, and were more expensive. Under this DARPA and NSF SBIRs, Sensor Electronic Technology, Inc. (SET) developed proprietary technology to fabricate DUV light emitting diodes (LEDs) based on a wideband gap III-Nitride material system. When an electrical signal (typically between 5 to 7 volts) is applied to these devices, the LEDs emit light in the ultraviolet spectral range. Depending on the application, the wavelength can be tuned to any frequency in the range from 247 to 365 nm. Analyzing fluorescence response from bio-agents using LEDs with various peak emission wavelengths is expected to detect and identify agents.

Customers include: U.S. Army, Department of Homeland Security, NASA, DARPA and more than 1,000 commercial customers worldwide who are using a wide variety of SET Deep UV LEDs. The company has created over 70 high-paying technological jobs. It is poised to increase the market size and market share. To create this new technology, Drs. Gaska and Shur submitted and received over 50 US and international patents and patent applications. Sensor Electronic Technology, Inc. received prestigious 2009 PRISM Award from Photonics West for the Best Photonics Product of the year, was twice selected as Finalist for IET Innovation Award, and received 2009 Best of Columbia Award.

CHRISTINE VILLA

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Ms. Villa has been providing unique long-term service to the SBIR and STTR programs for 21 plus years. She is the principal consultant to the DoD in the analysis and management of the SBIR STTR programs. Since 1990, she has been serving the SBIR/STTR community and all its participants in various capacities. Ms. Villa provides leadership to the Program and its participating agencies through program management, web and database development, outreach, and statistical analysis support. She administers, monitors, and coordinates the activities of the 13 DoD SBIR/STTR components, as well as interacts with the Small Business Administration (SBA), and other federal agency programs. Her continuous support has been a part of the DoD program's evolution—overseeing changes and improvements, adapting to new elements, leading the effort to recommend, and developing and implementing web-based resources and training tools.

Ms. Villa is a key player in providing annual program training to DoD SBIR government participants. She provides advice on program topics and kicks off the annual DoD SBIR/STTR Training Workshop with her widely known and well attended "SBIR 101" general session, presenting on key features, requirements, & eligibility; agency participation and funding; program administration; transition and commercialization; and tools and resources while always ending her session with ample time to answer questions from the attendees. She has supported numerous meetings and process action teams including 18 DoD SBIR Training Workshops, the 1994/1995 SBIR Process Action Team meetings and working groups, and the 1995 and 1997 DoD SADBUs Training Seminars.

SBIR

Hall of Fame

GENZYME CORPORATION

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In February 2010, Genzyme Corporation was acquired by French drug maker Sanofi-Aventis. Genzyme Corporation was a biotechnology and health care products company focused on developing innovative products and services for major unmet medical needs. Genzyme Corp. has three divisions. Each division has its own common stock intended to reflect its value and track its performance. Genzyme General develops and markets therapeutic and surgical products and diagnostic products and services. Genzyme Tissue Repair is a leading developer of biological products for the treatment of cartilage damage, severe burns, chronic skin ulcers, and neurological disorders.

Genzyme Molecular Oncology develops molecular approaches to cancer diagnosis and therapy through genomics, gene therapy, genetic diagnostics, and a small-molecule combinatorial chemistry drug discovery program. Genzyme Molecular Oncology's common stock is now publicly traded under the NASDAQ symbol GZMO.

Genzyme Corporation is a diversified human healthcare company with product development, manufacturing and market capabilities in biotherapeutics, diagnostic products and services, and pharmaceuticals. The company's product portfolio focuses on rare genetic disorders as well as organ transplant, osteoarthritis, and renal disease. One of its main products, Cerezyme, is a leading treatment for Gaucher's disease, a rare enzyme-deficiency condition. Genzyme also is involved in drug development and genetic testing and other services. Genzyme Molecular Oncology develops gene-based cancer diagnosis and treatment products, and Genzyme Biosurgery primarily makes orthopedic medical and surgical products. In September 2010, Genzyme Corporation sold its Genetics unit to Laboratory Corporation of America.

SENSORS UNLIMITED GOODRICH CORPORATION

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Sensors Unlimited, Inc. is now part of Goodrich ISR Systems. Sensors Unlimited, Inc. was acquired by Goodrich Corporation on November 1, 2005. Sensors Unlimited has become the world's leading manufacturer of indium gallium arsenide (InGaAs) photodiodes, arrays, and cameras for near-infrared (NIR) and shortwave infrared (SWIR) imaging applications.

Originally founded in 1991 as an advanced research and development company, Sensors Unlimited, Inc. quickly grew to become a major supplier of InGaAs technology, products, and shortwave IR imaging solutions.

Now as Goodrich ISR Systems Princeton, the facility features an ISO 9001:2008 certified manufacturing plant occupying over 20,000 square feet and includes Class 100 clean rooms, and a III-V foundry with an MOCVD epitaxial growth wafer fab. Products built on our proprietary InGaAs platform are SWIR cameras, 1- and 2- dimensional focal plane arrays (FPAs), extended wavelength response InGaAs image sensors, plus Goodrich ISR Systems has the resources to custom design structures and devices for a variety of customer requirements. Current deployments include laser tracking for weapons and communication systems, covert and fixed site surveillance, ground and air UV payloads, gimbal sensor assemblies, night vision and free space communications. Other applications for InGaAs technologies and imaging systems include near-infrared spectroscopy, security and surveillance, linescan inspection, process control, laser beam profiling, microscopy, art inspection and astronomy.